

	Bonn M.T.	R.A.	Decl.
^{1851.}	^h ^m ^s	[°] ['] ^{''}	[°] ['] ^{''}
Aug. 21	13 41 25.3	55 39 42.6	+ 5 29 5.0
22	13 14 40.7	56 10 28.2	+ 5 16 52.6
25	13 34 4.4	57 40 53.9	+ 4 39 33.5
Sept. 2	13 29 41.8	61 4 36.0	+ 2 55 56.9
24	12 57 31.4	65 49 64.2	- 2 8 56.7
	13 9 36.8	38.0	53.9
27	12 32 9.6	65 57 18.9	- 2 49 58.0
	13 42 55.7	0.4	109.6
Oct. 2	13 17 59.8	65 52 57.4	- 3 57 9.7
3	14 6 14.8	65 49 52.4	- 4 10 31.0
	14 37 43.3	44.5	28.8
4	13 45 1.1	65 45 38.4	- 4 22 58.2

The following observations were made by M. Schmidt :—

Sept. 7	13 38 30.2	62 45 30.1	+ 1 47 18.0
8	15 52 25.4	63 4 29.1	+ 1 32 41.2

Solar Eclipse of January 31, 1851, observed at Paramatta by Captain P. King, R.N., with Notices of other Observations of the Eclipse in Australia.

This eclipse was observed at Newlands, Paramatta, by Captain King, in conjunction with the Rev. W. B. Clarke, whose account is given in vol. xi. p. 223. The northern limit passed almost exactly over Captain King's station, but most probably the annulus was not formed. On February 1st, the Paramatta date of the eclipse, the sky became clear after a longish series of indifferent weather. The telescope used was a refractor by Watkins and Hill, of 2½ inches aperture and 44 inches focus, mounted equatorially, the eye-piece *direct* and magnifying about 40 times.

First contact, 4^h 6^m 6^s, Local M.T., within 3^s or 4^s.

When the eclipse approached its maximum phase, "The sky and terrestrial objects around were enveloped in a gloom of dull greenish hue, the moon's disc formed a huge black orbicular mass, suspended within a crescent of dazzling splendour,* while its lower edge seemed to be ploughing through a sea of fused metal. The cusps, which were attenuated to so acute an angle as to be scarcely definable, were so near each other and so rapidly approaching as

* Diameter of sun 32' 29.8" } Probably *tabular* diameters.
 — moon 29 40.5 }

Captain King states the smallest breadth of the uneclipsed portion of the sun to be 3' 6".7, but not whether this was *measured* or *computed*, probably the latter.

to be apparently on the point of meeting, when suddenly the interval was filled by a *thread* of pale white colour, and their forward motion stopped. This appearance only lasted 3^s or 4^s, when the thread disappeared, subdued by the rapid increase of returning light, as the cusps receded from each other in the progress of the eclipse; for they separated from each other as rapidly as they had previously approached." . . . "The junction, however, between the thread and the cusps was not quite complete; for immediately contiguous to the latter, their glare subdued the pale light of the *thread*, and beyond this small space, the darkened sky behind contrasted with it, and assisted to make it, to me at least, prominent and distinct, especially as the atmosphere on the horizon had become extremely clear." Captain King conceives that the annulus was never quite formed, but that the edge of the moon, enlightened from behind, filled up the gap with the *thread*.

"During the time when the cusps were so rapidly advancing and receding with respect to each other, the appearances known as BAILY'S *beads* were visible in their angles for some time. They resembled bubbles protruding from, and again dissolving in, the dark edge of the moon's limb; and at one time a black band appeared in a longitudinal direction, bisecting the angle of one of the cusps." Captain King refers to Mr. Clarke's account, the substance of which is given, vol. xi. pp. 224, 225. At the same place will be found the meteorological observations made by Mr. Clarke. The numerous spots on the sun were carefully measured by Captain King (a well-executed drawing accompanies the paper), and he noted the times when these spots were covered by the moon's limb; but as no corresponding observations were made, these observations are not given.

Last contact, 6^h 31^m 35^s, Local M.T.

At Newlands, the place of Captain King's observations, the Paramatta Observatory bears N. 88° 50' W. (true); distance, 6189 feet; which, with compression = $\frac{1}{304}$, makes Newlands 1".2 S., and 4^s.89 E. from Paramatta. Hence, using the position of Paramatta in the *Nautical Almanac*,

Newlands is in lat. 33° 48' 51" S.; long. 10^h 4^m 11^s E.

*Observations at Melbourne; Province, Port Phillip.**

Latitude 37° 49' S.; longitude 9^h 39^m 50^s E.

Mr. Latrobe, the lieutenant-governor of the province, kindly undertook to have the eclipse observed at Melbourne, which was nearly on the central line. Mr. Latrobe says, "The character of the light and its effect on the shadows were remarkable, but not easy to describe. The shadow of the stems of trees appeared streaky, and ill-defined on one side; that of leaves seemed surrounded by halos. The barometer was uninfluenced; the thermometer fell 5°, and afterwards rose 3°."

* This name is to be changed to Victoria.

Observations at Melbourne, by MM. Grover and Robertson.

^{1851.}		h m s				
Feb. 1	First external contact	3	27	56	Melbourne M.T.	
	— internal —	4	47	44	—	—
	Last — —	4	52	48	—	—
	— external —	6	2	3	—	—

Observations at Sydney, by Mr. A. Longmore.

Latitude $33^{\circ} 53' 30''$ S.; longitude $10^{\text{h}} 5^{\text{m}} 26^{\text{s}}$ E.

^{1851.}		h m s				
Feb. 1	First contact	4	7	44	Sydney M.T.	
	Last — —	6	32	58	—	—

Observations at Yarrowlumla, by Mr. Murray.

Latitude $35^{\circ} 19'$ S.; longitude 149° E.

The following is the substance of Mr. Murray's account:—
 "The annularity was decided here. We were evidently considerably within its northern limit, as the annularity lasted exactly 3^{m} . The disc of the moon appeared streaked by five stationary lines; its surface appeared rough. There was a slight glow of light over its dark face, on the upper part; its edges were uneven all round, but presented no striking irregularities. When the moon had passed over about a third of the sun, a deep crimson glow seemed to pass over his face, extended to the upper cusp, and then disappeared. On three occasions the cusps of the sun seemed blunted; but perhaps a little fatigue of the eye may account for all these appearances."

"At the commencement of the eclipse the thermometer in the shade stood at 82° , and, when exposed to the sun, at 93° . It fell during the annular phase to 77° , and by the end of the eclipse had risen to 86° ."

Using Mr. Woolhouse's formulæ and the data of the *Nautical Almanac*,* Captain King has computed the following longitudes:—

		h m s				
Paramatta	{ By beginning	10	4	14.3	East.	
	{ — end	10	3	58.3	—	
Melbourne	{ By beginning	9	39	52.6	East.	
	{ — end	9	39	54.1	—	

On the Determination of Elliptic Orbits. By M. Benjamin Valz.

In the *Connaissance des Temps* of 1835, the author gave a method for calculating directly the orbits of comets, sufficient for obtaining the first approximation to the elements, to be rectified afterwards

* It must not be forgotten that the data of the *Nautical Almanac* can only be relied upon within the limits of accuracy of the Solar and Lunar Tables, which are as yet far from perfection.